

at least one biopolymer having a weight average particle diameter of less than about 100 microns, as required by all pending claims. According to the Office Action, the Achtmann patent has been cited to provide a teaching that a biopolymer —xanthan gum— of a size under 100 microns is used in fire retardant compositions. Further, according to the Office Action, it would be obvious to employ a biopolymer of such small particle size in the Strickland composition “since a smaller particle size yields higher viscosities and better dispersions.” The Action, however, does not disclose the basis for the conclusions that higher viscosities or improved dispersions are desired or that smaller particle sizes do indeed yield higher viscosities and improved dispersion.

Moreover, the Achtmann patent is directed to the use of xanthan gum of particle size in the range of 50 to 250 mesh, which according to the Office Action corresponds to 60-300 microns, in a *fire extinguishing foam*. Therefore, the Achtmann patent suffers from at least two deficiencies.

First, a teaching of particles being in the range of 60 to 300 microns does not establish or even suggest that ANY particles of diameter under 100 microns were used, let alone that their *weight average particle diameter* is under 100 microns as required by the claims. Thus, the Achtmann patent does not teach any significance of maintaining the particle size under 100 microns. That the particles MAY be less than 100 microns is not a teaching or suggestion that they BE under 100 microns.

Second, the Achtmann patent is directed to foam fire extinguishers, which differ dramatically in mode of application and the mechanism by which they function from the compositions of the Strickland and Vandersall patents and EP 0 911 067, as well as the retardants of the subject claims. Teachings with respect to such foam fire extinguishers as are addressed by Achtmann are not applicable to the type of fire retardant disclosed in the other cited patents or the subject claims. The subject matter of the Achtmann patent is a biodegradable foam concentrate for use in extinguishing and controlling fire in Class B fuels (liquid hydrocarbons). Such foam concentrates are clear liquids containing surfactants, a film forming water-soluble polymer and a number of solvents (including water). The solvents are used primarily to obtain a clear concentrated liquid with a viscosity low enough so that it flows, is

miscible with water and can be pumped. These products, usually referred to as AFFF (aqueous film forming foam) or AR-AFFF (alcohol resistant-AFFF), generally contain at least one non-biodegradable fluorinated surfactant. Fluorinated surfactants are under environmental scrutiny since the discovery that their fluorinated surfactants are absorbed through the skin and are bio-accumulative. Thus, the Achtmann patent represents efforts of Class B fire-fighting foam manufacturers to develop effective and biodegradable Class B foams.

In use, Class B foam concentrates are diluted with water to prepare a solution containing 3 to 6% of the concentrate. The fluorinated surfactant mixture generally used in these products is capable of reducing the surface tension of water from about 78 to 15-18 dynes/cm². When applied from an aerating nozzle, this results in the formation of a thick layer of bubbles on the surface of a hydrocarbon. This low-density, water-containing foam extinguishes flaming hydrocarbon liquids and then floats on the surface forming a thick insulative blanket between the fuel and oxygen. The foam blanket remains on the surface long enough for the fuel to cool below its ignition temperature. The water-soluble polymer included in such products forms a film at the interface between the flammable liquid and the aqueous foam. This film improves the ability of the aqueous foam blanket to float on the lower density hydrocarbon liquids and improves the ability of the foam to 'heal' or close-over if it is disrupted so that a continuous blanket is maintained. Therefore, the water-soluble polymers used in fire-fighting foams are selected because they form a continuous film at the interface between hydrocarbon liquids and the aqueous foam, not because they are effective thickening agents for the aqueous foam solution. In fact, any increase in viscosity derived from a water-soluble-polymer would be undesirable because it would increase the viscosity of the foam concentrate so that it would be more difficult to pour, pump and mix with water. Thus, teachings with respect to such fire-extinguishers as addressed by Achtmann are unrelated and would be considered inapplicable to the aerially-applied retardants of Strickland, Vandersall and EP 0 911 067.

Moreover, the compositions of the subject claims use a water-soluble polymer (xanthan) of particle size under 100 microns that can be incorporated into a concentrated high ionic strength ammonium phosphate based fire retardant solution and stored therein for long periods of time before dilution to use concentration. During storage in the concentrated form, the small

polymer particles are suspended in the high ionic strength solution as discrete particles. Then, upon dilution, the polymer hydrates and the viscosity of the resultant solution increases to provide improved aerial drop characteristics when the fire retardant solution is discharged from an aircraft flying over the target area. This is true, even when dilution occurs more than a year after preparation of the original concentrated fire retardant. Water-soluble polymers with larger weight average particle sizes were found incapable of functioning in this manner after being subjected to storage in the high ionic strength fire retardant solution for more than a short time (hours to days). None of the art of record ever recognizes or suggests this surprising advantage of the use of such small polymer particles.

Accordingly, the Strickland patent, the Achtmann patent, the Vandersall patent and EP 0 911 0167, whether considered individually or in combination, do not teach or suggest the combination called for in the subject claims or the surprising advantages discovered to result from that combination. Thus, it is submitted that each of the subject claims define patentably over those references.

Claims 1-20 have been provisionally rejected under the doctrine of obviousness-type double patenting in view of certain claims of co-pending applications serial nos. 09/978,602 and 09/723,567. With respect to the claims of application serial no. 09/978,602, the subject provisional rejection would mature to an actual rejection only if anticipatory or obviousness-rendering claims actually issue in the '602 application while the subject application is still pending. If the subject application issues as a patent while the '602 application is still pending, no double-patenting issue should arise. First, the '602 application would not have issued during the pendency of the subject application and so cannot be the basis of a double-patenting rejection in the subject application. Second, the '602 application should then be allowable over the patent that issues from the subject application because the claims of the '602 application call for compositions that include additional components beyond those called for in the claims of the subject application and those additional components distinguish patentably over the claims of the subject application. Accordingly, it is applicant's intent to encourage issuance of the cases so that issuance of the subject application precedes that of the '602 application. Therefore, withdrawal of the subject provisional double-patenting rejection based on the '602 application,

or at least suspension thereof such that it is not re-asserted until and unless the '602 application issues prior to issuance of the subject application, and expeditious allowance of the subject application are respectfully requested.

With respect to application serial no. 09/723,567, the claims thereof do not call for biopolymer particles under 100 microns and so the subject claims distinguish patentably over the claims of the '567 application for the reasons discussed above with respect to other cited art references that do not teach or suggest biopolymer particles of such size. Accordingly, withdrawal of the subject provisional double-patenting rejection is respectfully requested.

Conclusion

In view of the foregoing, favorable reconsideration and early allowance of claims 1-20 are earnestly solicited.

Respectfully submitted,

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By:

A handwritten signature in black ink, appearing to be 'KS', written over a horizontal line.

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